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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/281,365	03/30/1999	DARREN D. NEUMAN	5201-19401	7152

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EXAMINER	
LEE, PING	

ART UNIT	PAPER NUMBER
2644	5

DATE MAILED: 12/01/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/281,365	NEUMAN, DARREN D.	
	Examiner	Art Unit	
	Ping Lee	2644	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 June 2003* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4,6-14,16-18,20 and 21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,6-14,16-18,20,21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

2. Claims 1-4, 6-14,16-18, 20 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Plunkett (US 5,386,478) in view of Dunlavy (US 5,778,087).

Regarding claims 1-4 and 6, Plunkett discloses an audio calibration system comprising a control logic (although not clearly shown, the remote control 10 of Plunkett is connected to a control logic to provide proper controls), an input device (22), a noise generator (col. 4, lines 5-6), a plurality of speakers (14s) and delay modules (24s). Plunkett fails to show a noise generator for generating pseudo-random noise signal, a display, coupled to the control logic and displaying a visual image indicating the relative position of a null line.

In the same field of endeavor, Dunlavy teaches an audio calibration system using pseudo-random generator for generating the test signal and a display for displaying a visual image (col. 3, lines 60-64) that indicates the relative position of a null line. By giving visual indication of a null point, the user using Dunlavy's method would know that no more adjustment is required and the adjustment is done. Plunkett teaches the use of a general pulse without specifying the detail. The specification also fails to specify the reason for using pseudo-random noise generator. Thus, it would have been obvious to one of ordinary skill in the art to modify Plunkett's system in view of Dunlavy by using a

pseudo-random generator for generating the test signal and a display for indicating the relative position of a null line in order to informing the user when the adjustment is done.

Regarding claim 7, Plunkett fails to show an inverter. Plunkett teaches an automatic calibrator in which the resultant signals from two speakers would be analyzed (col. 3, lines 44-46) without disclosing the detail of analysis and how to determine the inequality in delay. Dunlavy teaches that one way of determining the inequality is to analyze the resultant signals from two speakers by inverting the signal applied to left speaker relative to the signal applied to the right speaker. By doing so, at the perfect balance spot, the resultant signal measured by the microphone should be a null. Dunlavy show the inverter is located between the noise generator (20) and the delay (the space between the speakers and microphone). Based on the concept of a linear control system, the order of the inverter and the delay is interchangeable. That is, (inverter)*(delay) = (delay) * (inverter); wherein "inverter" represents the transfer function of the inverter and "delay" represents the transfer function of the delay module. Thus, it would have been obvious to one of ordinary skill in the art to modify Plunkett's system in view of Dunlavy by using an inverter for inverting the signal applied to one speaker relative to another speaker in order to accurately determine the perfect balance spot using the microphone to measure the null.

Regarding claim 8, Plunkett fails to show the low pass filter. Dunlavy teaches that only a portion of the noise signal within the audible sound spectrum is needed for calibration. Thus, it would have been obvious to one of ordinary skill in the art to modify

Plunkett's system in view of Dunlavy by using a low pass filter in order to obtain a portion of the noise signal within the audible sound spectrum.

Regarding claims 9, 10, 12 and 14, the limitation of this claim has been discussed above with respect to claims 1-4, 7 and 8.

Regarding claim 13, Plunkett and Dunlavy fail to show that the noise generator and a low pass filter are implemented using digital signal processing. It was well known in the art that to implement the analog circuitry, such as a noise generator and a low pass filter, using digital signal processing in order to provide fast and accurate calculation and solution. Thus, it would have been obvious to one of ordinary skill in the art to further modify Plunkett's system in view of Dunlavy by using the well known DSP generating the noise signal and low pass filtering the signal because it was considered as a matter of engineering design choice to using either the analog circuitry or the equivalent DSP circuitry.

Regarding claims 11, 16 and 17, Plunkett fails to show how to adjust the location of a null line for a second and third speakers. Plunkett teaches a high priced sophisticated stereo system with a remote control (col. 2, lines 46-63). It was well known to those skilled in the art that a well known surround sound home theater system usually comprising a television, DVD, VCR and a sophisticated stereo audio system having more than two speakers controlled by an universal remote control. It was well known in the art that a premium DVD includes an on-screen display controller. Although Plunkett explicitly teaches of calibrating two speakers, the well known surround sound home theater system also would benefit from using the audio

calibration system as taught Plunkett to compensate the unequal delay posed by three or more different speakers. Thus, it would have been obvious to one of ordinary skill in the art to utilize Plunkett's system in view of Dunlavy to calibrate a well known surround sound home theater system by calibrating delay between a reference speaker and a first speaker and calibrating the delay between the reference speaker and a second speaker one at a time in order to calibrate the delay between various speakers in the surround sound system.

Regarding claims 18, 20 and 21, the limitation of this claim has been discussed above with respect to claims 1-4.

Response to Arguments

3. Applicant's arguments filed 9/16/03 have been fully considered but they are not persuasive.

Applicant argued that Dunlavy teaches a sound level meter "to indicate decibels, and would not provide a visual image having any indication of position".

Examiner disagreed. The sound level meter in Dunlavy indicates the combined sound levels from two speakers. When the speakers are not located in equal distance from the listener, Dunlavy teaches that the combined sound levels will not be a null. The listener will use the sound level meter as a visual indicator for determining the null, which indicating the relative position of the null line. Therefore, Dunlavy does teach the claimed limitation.

Applicant argued that the combination of Plunkett of Dunlavy fails to show the claimed inverter being located between the noise generator and the delay.

As discussed above, Plunkett fails to teach how to perform the analysis of the resultant signal from the two speakers. Dunlavy teaches how to perform the analysis based on the concept of inverting the phrase of the signal applied to one speaker relative to the other. Based on the law of a linear control system, the order of the inverter and the delay is interchangeable. That is, (inverter)*(delay) = (delay) * (inverter). Therefore, it would have been obvious to place the inverter between noise generator and the delay because this is functionally equivalent as placing the delay between the noise generator and the inverter.

Applicant argued that Dunlavy fails to suggest using a low pass filter.

An audible sound spectrum, as well known to those in the art, is from 20 Hz to 20 kHz. The claim never specifies the cutoff frequency of the low pass filter. Therefore, any well low pass filter, ensures that the output containing a portion of a noise signal within the audible sound spectrum, could be used.

Applicant argued that Plunkett and Dunlavy fail to provide support of providing a noise signal to a reference speaker and a first speaker and providing the noise to the reference speaker and a second speaker.

The goal, as taught by both Plunkett and Dunlavy, is to find the perfect balance spot between two speakers using the delay caused by adjusting the generation of the speaker signal (Plunkett) or physical moving along the line (Dunlavy). Since a more sophisticated surround sound system involving more than two speakers, one skilled in

the art would have expected that the third, fourth or fifth speakers needs calibration as well. If the balance is determined for a first set of speakers and then a second set of different speakers, this, as one would have expected, will not guarantee that the listener is located at a perfect balance spot between the first set and second set of speakers. Using one speaker as a reference, and performing calibration one extra speaker at a time would balance all speakers.

Regarding claim 18, applicant argued that the claimed limitation "processing said audio signal to determine a minimum amplitude level".

This limitation has been addressed before with respect to claims 1-4. By adjusting the delay (processing the audio signal), a null will be confirmed using the sound level meter.

Conclusion

4. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ping Lee whose telephone number is 703-305-4865. The examiner can normally be reached on Monday and Tuesday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Forester W Isen can be reached on 703-305-4386. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9314 for regular communications and 703-872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-4750.

Ping Lee
Primary Examiner
Art Unit 2644

pwl
November 26, 2003